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SOLAR/1087-79/04

Monthly Performance Report

ORTIZ & REILL DEVELOPERS, INC.
HOUSE LOT 8

APRIL 1979

U.S. Department of Energy

National Solar Heating and Cooling Demonstration Program

National Solar Data Program

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MONTHLY PERFORMANCE REPORT

ORTIZ & REILL DEVELOPERS, INC.
HOUSE LOT 8

APRIL 1979

I. SYSTEM DESCRIPTION

Ortiz & Reill Developers, Inc., House Lot 8, is one of two instrumented single-family residences in Escondido, California. The home has approximately 1536 square feet of conditioned space. Solar energy is used for domestic-hot-water (DHW) heating and space heating. The solar energy system has an array of flat-plate collectors with a gross area of 192 square feet. The array faces 29 degrees east of south at an angle of 45 degrees to the horizontal. Water is the transfer medium that delivers solar energy from the collector array to storage and to the space heating and hot water loads. Solar energy is stored in a 750-gallon tank located in the ground floor utility room. Heated city water is stored in a 66-gallon DHW tank. When solar energy is insufficient to satisfy the space heating load, a gas furnace provides auxiliary energy for the space heating system. Similarly, an electrical heating element in the DHW tank provides auxiliary energy for DHW heating. Energy from an hydronic fireplace radiates directly into the living space and supplements solar modes 1 and 2. The fireplace-to-storage mode activates if the fireplace is being used, the temperature difference between its water plenum and storage output is more than 9°F, and there is no demand for space heating. During operation, water is circulated from storage through the fireplace heat exchanger. The system, shown schematically in Figure 1, has four modes of solar operation.

Mode 1 - Collector-to-Storage: This mode activates when the temperature at the outlet of the collector array exceeds the temperature at the bottom of the storage tank by more than 9°F. Water is circulated from the tank through the collectors until the temperature difference is less than 3°F.

Mode 2 - Storage-to-Space Heating: This mode activates when the manually preset thermostat located in the heated space indicates a demand for space heating. Heated water is circulated from storage through a heat exchanger in the air-handling unit and returned to storage. If the demand cannot be satisfied by energy from storage, the gas furnace is activated to provide auxiliary heat. The fireplace can also add energy to the water circulating from storage before it enters the air-handling unit. If the fireplace is being used and the temperature difference between its water plenum and storage output is more than 9°F, valve D400 is activated and energy is added to the water from the fireplace heat exchanger.

Mode 3 - Storage-to-DHW: This mode activates when there is a temperature difference exceeding a preset differential between storage and the DHW tank and there is no demand for space heating. Incoming city water enters the DHW tank, where it is heated by water circulating from storage through a heat exchanger in the tank.

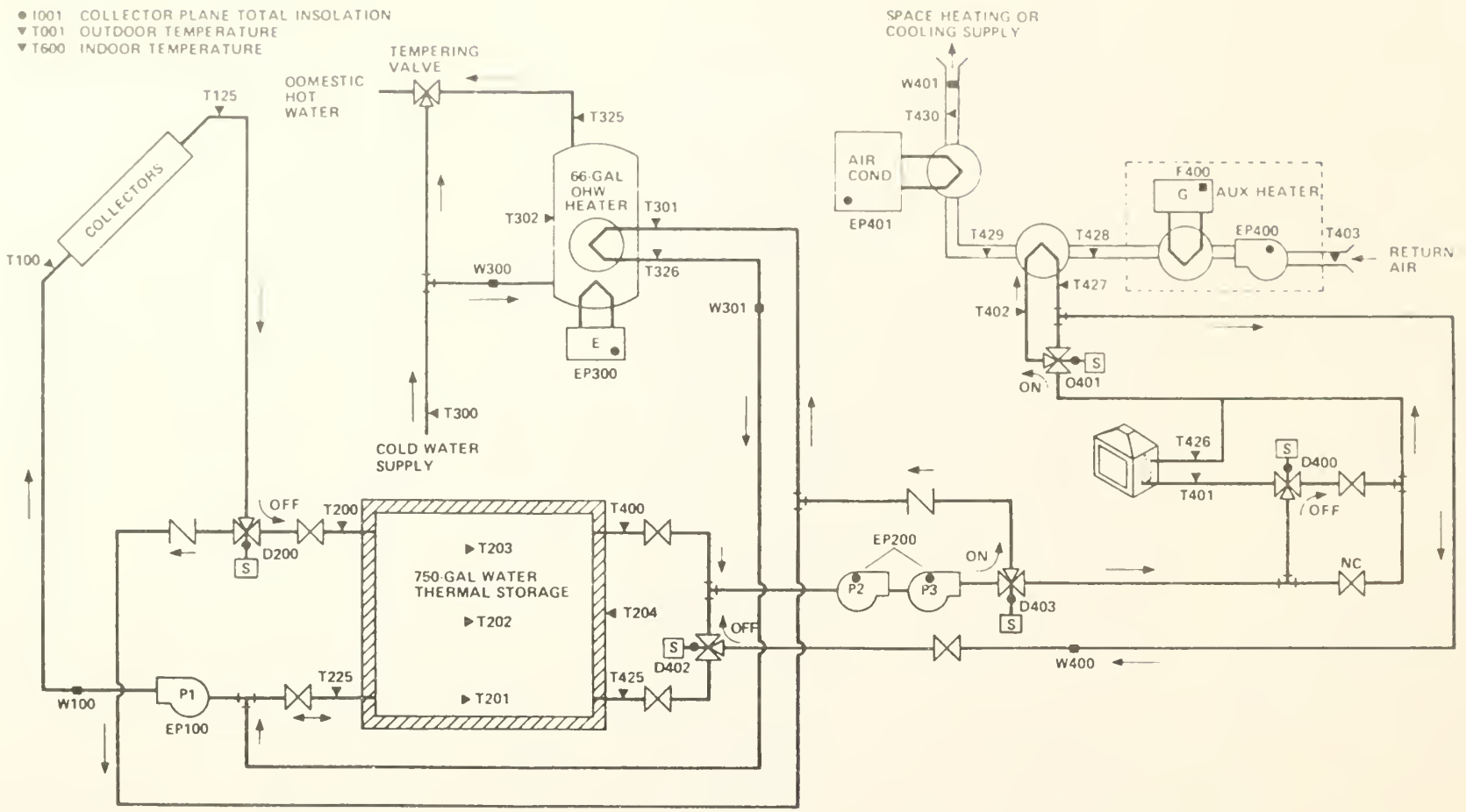

Figure 1. ORTIZ AND REILL DEVELOPERS, INC., LOT NO. 8 SOLAR ENERGY SYSTEM SCHEMATIC

Mode 4 - Collector-to-DHW: This mode activates when the temperature in the DHW tank falls below 140°F and the collector output temperature exceeds the DHW tank temperature. Water circulates through the heat exchanger in the DHW tank and returns to the collectors.

II. PERFORMANCE EVALUATION

INTRODUCTION

The site was occupied during the month of April. The solar energy system operated continuously for 30 days during the month. Solar energy satisfied 100 percent of the DHW requirements and 9 percent of the space heating requirements. The solar energy system provided an electrical energy savings of 0.37 million Btu and a fossil fuel energy savings of 0.17 million Btu.

WEATHER CONDITIONS

During the month, total incident solar energy on the collector array was 10.8 million Btu for a daily average of 1866 Btu per square foot. This was almost equal to the estimated average daily solar radiation for this geographical area during April of 1856 Btu per square foot for a plane facing 29 degrees east of south with a tilt of 45 degrees to the horizontal. The average ambient temperature during April was 61°F and was equal to the long-term average for April. The number of heating degree-days for the month (based on a 65°F reference) was 125, as compared with the long-term average of 144. The number of cooling degree-days was 4, as compared with the average of 15.

THERMAL PERFORMANCE

Collector - The total incident solar radiation on the collector array for the month of April was 10.8 million Btu. During the period the collector loop was operating, the total insolation amounted to 9.0 million Btu. The total collected solar energy for the month of April was 3.0 million Btu, resulting in a collector array efficiency of 28 percent, based on total incident insolation. Solar energy delivered from the collector array to storage was 0.98 million Btu, while solar energy delivered from the collector array directly to the loads amounted to 0.79 million Btu. Energy loss during transfer from the collector array to storage and loads was 1.2 million Btu. This loss represented 40 percent of the energy collected. Operating energy required by the collector loop was 0.095 million Btu.

Storage - Solar energy delivered to storage was 0.98 million Btu. There were 0.35 million Btu delivered from storage to the DHW and space heating subsystems. Energy loss from storage was 0.55 million Btu. This loss represented 56 percent of the energy delivered to storage. The storage efficiency was 44 percent: This is calculated as the ratio of the sum of the energy removed from storage and the change in stored energy, to the energy delivered to storage. The average storage temperature for the month was 113°F.

DHW Load - The DHW subsystem consumed 0.89 million Btu of solar energy to satisfy a hot water load of 0.71 million Btu. The solar fraction of this load was 100 percent. Losses from the DHW subsystem were 0.18 million Btu. The DHW subsystem consumed a total of 0.40 million Btu of operating energy, resulting in an electrical energy savings of 0.48 million Btu. A daily average of 44 gallons of DHW was consumed at an average temperature of 148°F delivered from the tank.

Space Heating Load - The space heating subsystem consumed 0.099 million Btu of solar energy and 0.97 million Btu of auxiliary thermal energy (equivalent to 1.6 million Btu of auxiliary fossil fuel energy) to satisfy a space heating load of 1.1 million Btu. The solar fraction of this load was 9 percent. The space heating subsystem consumed a total of 0.052 million Btu of operating energy, resulting in an electrical energy expense of 0.015 million Btu and a fossil fuel energy savings of 0.17 million Btu.

OBSERVATIONS

In satisfying 46 percent of the combined DHW and space heating load, a total of 2.1 million Btu was lost from the system. Energy loss during transport from the collector array to storage and the DHW heat exchanger equalled 1.2 million Btu. Transport losses between storage and the DHW heat exchanger added to energy loss between storage and the space heating heat exchanger totalled 0.16 million Btu. Thermal losses from the storage tank and the DHW subsystem totalled 0.73 million Btu. The system losses represented 70 percent of the solar energy collected for the month.

ENERGY SAVINGS

The solar energy system provided a net electrical energy savings of 0.37 million Btu and a fossil fuel energy savings of 0.17 million Btu. The DHW subsystem provided an electrical energy savings of 0.48 million Btu. The space heating subsystem incurred an electrical energy expense of 0.015 million Btu and contributed a fossil fuel energy savings of 0.17 million Btu.

III. ACTION STATUS

There are currently no action items.

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
SITE SUMMARY

SITE: ORTIZ AND REILL, LOT 8 ESCONDIDO, CALIFORN SOLAR/1087-79/04
REPORT PERIOD: APRIL,1979

SITE/SYSTEM DESCRIPTION:
ORTIZ AND REILL IS A SINGLE FAMILY DWELLING. THE SOLAR ENERGY SYSTEM PROVIDES SPACE HEATING AND DOMESTIC HOT WATER HEATING. WATER IS USED AS THE ENERGY COLLECTION AND STORAGE MEDIUM. SOLAR ENERGY IS SUPPLIED TO THE DHW TANK THROUGH A HEAT EXCHANGER WHICH CONNECTS TO THE COLLECTION LOOP OR TO THE STORAGE TANK. ELECTRICAL RESISTANCE COILS PROVIDE AUXILIARY ENERGY AS REQUIRED. SOLAR ENERGY IS SUPPLIED TO THE SPACE HEATING SYSTEM FROM THE STORAGE TANK. A FIREPLACE AND A GAS FIRED FURNACE PROVIDE AUXILIARY ENERGY AS REQUIRED.

GENERAL SITE DATA:

INCIDENT SOLAR ENERGY	10.750 MILLION BTU
	55988 BTU/SQ.FT.
COLLECTED SOLAR ENERGY	2.995 MILLION BTU
	15598 BTU/SQ.FT.
AVERAGE AMBIENT TEMPERATURE	61 DEGREES F
AVERAGE BUILDING TEMPERATURE	71 DEGREES F
ECSS SOLAR CONVERSION EFFICIENCY	0.09
ECSS OPERATING ENERGY	0.095 MILLION BTU
TOTAL SYSTEM OPERATING ENERGY	0.550 MILLION BTU
TOTAL ENERGY CONSUMED	5.151 MILLION BTU

SUBSYSTEM SUMMARY:

	HOT WATER	HEATING	COOLING	SYSTEM TOTAL
LOAD	0.709	1.083	N.A.	1.782 MILLION BTU
SOLAR FRACTION	100	9	N.A.	46 PERCENT
SOLAR ENERGY USED	0.886	0.099	N.A.	0.986 MILLION BTU
OPERATING ENERGY	0.403	0.052	N.A.	0.550 MILLION BTU
AUX. THERMAL ENERGY	0.000	0.966	N.A.	0.983 MILLION BTU
AUX. ELECTRIC FUEL	0.000	N.A.	N.A.	0.000 MILLION BTU
AUX. FOSSIL FUEL	N.A.	1.579	N.A.	1.579 MILLION BTU
ELECTRICAL SAVINGS	0.483	-0.015	N.A.	0.374 MILLION BTU
FOSSIL SAVINGS	N.A.	0.165	N.A.	0.165 MILLION BTU

SYSTEM PERFORMANCE FACTOR: 0.523

* DENOTES UNAVAILABLE DATA
@ DENOTES NULL DATA
N.A. DENOTES NOT APPLICABLE DATA

REFERENCE: USER'S GUIDE TO THE MONTHLY PERFORMANCE REPORT OF THE NATIONAL SOLAR DATA PROGRAM,FEBRUARY 28,1978, SOLAR/0004-78/18

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
SITE SUMMARY

SITE: ORTIZ AND REILL, LOT 8 ESCONDIDO, CALIFORN SOLAR/1087-79/04
REPORT PERIOD: APRIL,1979

SITE/SYSTEM DESCRIPTION:
ORTIZ AND REILL IS A SINGLE FAMILY DWELLING. THE SOLAR ENERGY SYSTEM PROVIDES SPACE HEATING AND DOMESTIC HOT WATER HEATING. WATER IS USED AS THE ENERGY COLLECTION AND STORAGE MEDIUM. SOLAR ENERGY IS SUPPLIED TO THE DHW TANK THROUGH A HEAT EXCHANGER WHICH CONNECTS TO THE COLLECTION LOOP OR TO THE STORAGE TANK. ELECTRICAL RESISTANCE COILS PROVIDE AUXILIARY ENERGY AS REQUIRED. SOLAR ENERGY IS SUPPLIED TO THE SPACE HEATING SYSTEM FROM THE STORAGE TANK. A FIREPLACE AND A GAS FIRED FURNACE PROVIDE AUXILIARY ENERGY AS REQUIRED.

GENERAL SITE DATA:

INCIDENT SOLAR ENERGY	11.341 GIGA JOULES
	635798 KJ/SQ.M.
COLLECTED SOLAR ENERGY	3.159 GIGA JOULES
	177128 KJ/SQ.M.
AVERAGE AMBIENT TEMPERATURE	16 DEGREES C
AVERAGE BUILDING TEMPERATURE	22 DEGREES C
ECSS SOLAR CONVERSION EFFICIENCY	0.09
ECSS OPERATING ENERGY	0.100 GIGA JOULES
TOTAL SYSTEM OPERATING ENERGY	0.580 GIGA JOULES
TOTAL ENERGY CONSUMED	5.474 GIGA JOULES

SUBSYSTEM SUMMARY:

	HOT WATER	HEATING	COOLING	SYSTEM TOTAL
LOAD	0.749	1.142	N.A.	1.880 GIGA JOULES
SOLAR FRACTION	100	9	N.A.	46 PERCENT
SOLAR ENERGY USED	0.935	0.103	N.A.	1.040 GIGA JOULES
OPERATING ENERGY	0.425	0.055	N.A.	0.580 GIGA JOULES
AUX. THERMAL ENG	0.000	1.019	N.A.	1.038 GIGA JOULES
AUX. ELECTRIC FUEL	0.000	N.A.	N.A.	0.000 GIGA JOULES
AUX. FOSSIL FUEL	N.A.	1.666	N.A.	1.666 GIGA JOULES
ELECTRICAL SAVINGS	0.510	-0.016	N.A.	0.794 GIGA JOULES
FOSSIL SAVINGS	N.A.	0.175	N.A.	0.175 GIGA JOULES

SYSTEM PERFORMANCE FACTOR: 0.527

* DENOTES UNAVAILABLE DATA
@ DENOTES NULL DATA
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REFERENCE: USER'S GUIDE TO THE MONTHLY PERFORMANCE REPORT OF THE NATIONAL SOLAR DATA PROGRAM,FEBRUARY 28,1978, SOLAR/0004-78/18

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
ENERGY COLLECTION AND STORAGE SUBSYSTEM (ECSS)

SITE: ORTIZ AND REILL, LOT 8 ESCONDIDO, CALIFORN SOLAR/1087-79/04
REPORT PERIOD: APRIL,1979

DAY OF MONTH	INCIDENT SOLAR ENERGY MILLION BTU	AMBIENT TEMP DEG-F	ENERGY TO LOADS MILLION BTU	AUX THERMAL TO ECSS MILLION BTU	ECSS OPERATING ENERGY MILLION BTU	ECSS ENERGY REJECTED MILLION BTU	ECSS SOLAR CONVERSION EFFICIENCY
1	0.424	58	0.030	0.000	0.005	N	0.071
2	0.455	59	0.036	0.000	0.004	O	0.079
3	0.423	59	0.044	0.000	0.003	T	0.104
4	0.446	64	0.039	0.000	0.004		0.088
5	0.432	64	0.044	0.000	0.004	A	0.102
6	0.327	60	0.030	0.000	0.003	P	0.091
7	0.301	60	0.049	0.000	0.003	P	0.164
8	0.114	59	0.009	0.000	0.001	L	0.079
9	0.063	56	0.024	0.000	0.000	I	0.384
10	0.391	57	0.028	0.000	0.005	C	0.071
11	0.234	57	0.029	0.000	0.004	A	0.126
12	0.422	63	0.050	0.000	0.004	B	0.119
13	0.435	68	0.049	0.000	0.004	L	0.114
14	0.398	65	0.007	0.000	0.004	E	0.017
15	0.360	53	0.008	0.000	0.003		0.023
16	0.239	61	0.030	0.000	0.002		0.126
17	0.298	59	0.025	0.000	0.003		0.082
18	0.356	56	0.035	0.000	0.003		0.097
19	0.474	59	0.094	0.000	0.004		0.199
20	0.443	63	0.037	0.000	0.004		0.083
21	0.401	61	0.028	0.000	0.003		0.070
22	0.423	60	0.039	0.000	0.003		0.091
23	0.433	59	0.038	0.000	0.003		0.089
24	0.435	61	0.030	0.000	0.003		0.068
25	0.372	64	0.026	0.000	0.003		0.070
26	0.442	66	0.043	0.000	0.003		0.097
27	0.327	63	0.024	0.000	0.002		0.072
28	0.233	60	0.024	0.000	0.001		0.103
29	0.394	63	0.013	0.000	0.003		0.033
30	0.255	63	0.023	0.000	0.001		0.090
SUM	10.750	-	0.986	0.000	0.095	N.A.	-
AVG	0.358	61	0.033	0.000	0.003	N.A.	0.092
NBS ID	Q001	N113			Q102		N111

* DENOTES UNAVAILABLE DATA.
@ DENOTES NULL DATA.
N.A. DENOTES NOT APPLICABLE DATA.

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
COLLECTOR ARRAY PERFORMANCE

SITE: ORTIZ AND REILL, LOT 8 ESCONDIDO, CASOLAR/1087-79/04
REPORT PERIOD: APRIL,1979

DAY OF MONTH	INCIDENT SOLAR ENERGY MILLION BTU	OPERATIONAL INCIDENT ENERGY MILLION BTU	COLLECTED SOLAR ENERGY MILLION BTU	DAYTIME AMBIENT TEMP DEG F	COLLECTOR ARRAY EFFICIENCY
1	0.424	0.404	0.108	73	0.256
2	0.455	0.402	0.137	70	0.302
3	0.423	0.372	0.138	75	0.327
4	0.446	0.395	0.132	83	0.297
5	0.432	0.378	0.135	83	0.312
6	0.327	0.256	0.058	71	0.178
7	0.301	0.266	0.078	*	0.261
8	0.114	0.057	0.011	64	0.099
9	0.063	0.000	0.000	*	0.000
10	0.391	0.371	0.067	67	0.171
11	0.234	0.214	0.017	66	0.073
12	0.422	0.391	0.168	75	0.399
13	0.435	0.402	0.168	85	0.386
14	0.398	0.348	0.155	*	0.390
15	0.360	0.291	0.121	74	0.338
16	0.230	0.193	0.036	68	0.151
17	0.298	0.245	0.042	65	0.142
18	0.356	0.290	0.078	67	0.219
19	0.474	0.410	0.155	71	0.328
20	0.443	0.385	0.156	77	0.353
21	0.401	0.351	0.155	*	0.385
22	0.423	0.341	0.112	75	0.266
23	0.433	0.349	0.111	75	0.256
24	0.435	0.358	0.124	74	0.285
25	0.372	0.286	0.103	82	0.277
26	0.442	0.359	0.135	79	0.307
27	0.327	0.225	0.078	74	0.239
28	0.233	0.159	0.041	*	0.176
29	0.394	0.319	0.133	76	0.339
30	0.255	0.129	0.038	71	0.148
SUM	10.750	8.986	2.995	-	-
AVG	0.358	0.300	0.100	74	0.279
NBSID	0001		0100		N100

* DENOTES UNAVAILABLE DATA.
@ DENOTES NULL DATA.
N.A. DENOTES NOT APPLICABLE DATA.

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
STORAGE PERFORMANCE

SITE: ORTIZ AND REILL, LOT 8 ESCONDIDO, CASOLAR/1037-79/04
REPORT PERIOD: APRIL,1979

DAY OF MONTH	ENERGY TO STORAGE MILLION BTU	ENERGY FROM STORAGE MILLION BTU	CHANGE IN STORED ENERGY MILLION BTU	STORAGE AVERAGE TEMP DEG F	STORAGE EFFICIENCY
1	0.018	0.000	0.018	105	1.036
2	0.030	0.004	0.009	108	0.413
3	0.028	0.003	0.015	110	0.674
4	0.034	0.004	0.022	113	0.780
5	0.049	0.009	0.015	118	0.480
6	-0.002	0.010	-0.035	115	12.070
7	0.001	0.038	-0.038	109	-0.466
8	0.001	0.007	-0.005	103	1.607
9	0.000	0.028	-0.053	100	1.000
10	0.001	0.002	-0.008	92	-11.447
11	-0.017	0.010	-0.018	90	0.501
12	0.043	0.002	0.039	91	0.942
13	0.048	0.001	0.044	101	0.942
14	0.078	0.000	0.069	112	0.885
15	0.050	0.000	0.016	121	0.312
16	-0.001	0.023	-0.040	117	26.391
17	0.008	0.010	-0.026	111	-2.072
18	0.007	0.010	-0.011	107	-0.212
19	0.074	0.055	-0.010	109	0.610
20	0.074	0.001	0.054	111	0.751
21	0.076	0.007	0.039	119	0.603
22	0.054	0.021	0.003	126	0.440
23	0.050	0.007	0.000	124	0.152
24	0.069	0.012	0.019	127	0.455
25	0.044	0.015	-0.000	128	0.326
26	0.065	0.027	0.010	130	0.578
27	0.030	0.009	-0.016	128	-0.236
28	0.004	0.016	-0.034	123	-4.174
29	0.063	0.004	0.035	124	0.611
30	0.004	0.013	-0.032	123	-4.967
SUM	0.981	0.348	0.078	-	-
AVG	0.033	0.012	0.003	113	0.435
NBS ID	Q200	Q201	Q202		N108

* DENOTES UNAVAILABLE DATA.
@ DENOTES NULL DATA.
N.A. DENOTES NOT APPLICABLE DATA.

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
HOT WATER SUBSYSTEM

SITE: ORTIZ AND REILL, LOT 8 ESCONDIDO, CALIFORN SOLAR/1087-79/04
REPORT PERIOD: APRIL,1979

DAY OF MON.	HOT WATER LOAD MILLION BTU	SOLAR FR.OF LOAD PER CENT	SOLAR ENERGY USED MILLION BTU	OPER ENERGY MILLION BTU	AUX THERMAL USED MILLION BTU	AUX ELECT FUEL MILLION BTU	AUX FOSSIL FUEL MILLION BTU	ELECT ENERGY SAVINGS MILLION BTU	FOSSIL ENERGY SAVINGS MILLION BTU	SUP. WAT. TEMP DEG F	HOT WAT. TEMP DEG F	HOT WATER USED GAL
1	0.021	100	0.030	0.016	0.000	0.000	N	0.014	N	78	150	20
2	0.053	100	0.036	0.009	0.000	0.000	O	0.028	O	84	160	79
3	0.021	100	0.044	0.010	0.000	0.000	T	0.035	T	87	153	37
4	0.012	100	0.039	0.004	0.000	0.000		0.035		85	147	24
5	0.045	100	0.044	0.005	0.000	0.000	A	0.039	A	88	162	53
6	0.030	100	0.030	0.017	0.000	0.000	*	0.013	*	81	149	52
7	0.021	100	0.031	0.016	0.000	0.000	D	0.015	D	100	161	55
8	0.020	100	0.009	0.023	0.000	0.000	L	-0.014	L	78	136	60
9	0.014	100	0.005	0.024	0.000	0.000	1	-0.019	1	70	107	42
10	0.019	100	0.028	0.015	0.000	0.000	C	0.013	C	73	113	52
11	0.034	100	0.026	0.015	0.000	0.000	A	0.004	A	72	125	46
12	0.018	100	0.050	0.008	0.000	0.000	R	0.042	R	82	143	48
13	0.001	100	0.049	0.007	0.000	0.000	I	0.042	I	128	171	3
14	0.000	0	0.007	0.004	0.000	0.000	F	0.000	F	152	172	0
15	0.014	100	0.038	0.010	0.000	0.000		-0.001		142	172	19
16	0.035	100	0.030	0.014	0.000	0.000		0.016		80	142	47
17	0.025	100	0.025	0.018	0.000	0.000		0.006		88	130	53
18	0.012	100	0.035	0.012	0.000	0.000		0.023		88	127	27
19	0.032	100	0.042	0.009	0.000	0.000		0.033		90	141	56
20	0.002	100	0.037	0.012	0.000	0.000		0.025		121	155	3
21	0.030	100	0.028	0.013	0.000	0.000		0.015		82	140	54
22	0.054	100	0.039	0.015	0.000	0.000		0.030		80	140	93
23	0.023	100	0.038	0.009	0.000	0.000		0.029		101	153	47
24	0.027	100	0.030	0.014	0.000	0.000		0.016		86	152	46
25	0.030	100	0.026	0.014	0.000	0.000		0.013		84	143	54
26	0.045	100	0.043	0.014	0.000	0.000		0.029		85	149	81
27	0.018	100	0.024	0.015	0.000	0.000		0.008		78	140	33
28	0.021	100	0.024	0.021	0.000	0.000		0.003		107	155	36
29	0.014	100	0.013	0.017	0.000	0.000		-0.005		110	156	24
30	0.022	100	0.023	0.019	0.000	0.000		0.004		100	150	41
SUM	0.709	-	0.886	0.403	0.000	0.000	N.A.	0.483	N.A.	-	-	1217
AVG	0.024	100	0.030	0.013	0.000	0.000	N.A.	0.016	N.A.	96	148	44
NBS	0302	N300	0300	0302	0301	0305	0304	0311	0313	N305	N307	N308

* DENOTES UNAVAILABLE DATA.
0 DENOTES NULL DATA.
N.A. DENOTES NOT APPLICABLE DATA.

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
SPACE HEATING SUBSYSTEM

SITE: ORTIZ AND REILL, LOT 8 ESCONDIDO, CA SOLAR/1087-79/04
REPORT PERIOD: APRIL,1979

DAY OF MON.	SPACE HEATING LOAD MILLION BTU	SOLAR FR.OF LOAD PCT	SOLAR ENERGY USED MILLION BTU	OPER ENERGY MILLION BTU	AUX THERMAL USED MILLION BTU	AUX ELECT FUEL MILLION BTU	AUX FOSSIL FUEL MILLION BTU	ELECT ENERGY SAVINGS MILLION BTU	FOSSIL ENERGY SAVINGS MILLION BTU	BLDG TEMP DEG. F	AMB TEMP DEG. F
1	0.043	0	0.000	0.002	0.043	N	0.072	0.000	0.000	70	58
2	0.022	0	0.000	0.000	0.021	O	0.036	0.000	0.000	69	59
3	0.098	0	0.000	0.002	0.098	T	0.163	0.000	0.000	70	59
4	0.059	0	0.000	0.001	0.057		0.094	0.000	0.000	72	64
5	0.020	0	0.000	0.000	0.020	A	0.033	0.000	0.000	72	64
6	0.063	0	0.000	0.001	0.063	P	0.104	0.000	0.000	72	60
7	0.053	34	0.018	0.006	0.033	P	0.055	-0.002	0.030	72	60
8	0.021	0	0.000	0.000	0.021	L	0.034	0.000	0.000	70	59
9	0.101	19	0.019	0.012	0.076	I	0.127	-0.005	0.032	71	56
10	0.077	0	0.000	0.003	0.075	C	0.125	0.000	0.000	72	57
11	0.110	9	0.010	0.007	0.101	A	0.168	-0.002	0.016	71	57
12	0.091	0	0.000	0.002	0.085	B	0.142	0.000	0.000	72	63
13	0.029	0	0.000	0.001	0.028	L	0.047	0.000	0.000	75	68
14	0.022	0	0.000	0.000	0.020	E	0.033	0.000	0.000	73	65
15	0.021	0	0.000	0.000	0.021		0.034	0.000	0.000	73	63
16	0.018	0	0.000	0.001	0.019		0.031	0.000	0.000	73	61
17	0.021	0	0.000	0.000	0.021		0.036	0.000	0.000	71	58
18	0.026	0	0.000	0.002	0.026		0.044	0.000	0.000	70	56
19	0.105	50	0.052	0.013	0.053		0.089	-0.005	0.087	72	59
20	0.018	0	0.000	0.000	0.019		0.031	0.000	0.000	72	63
21	0.020	0	0.000	0.000	0.020		0.033	0.000	0.000	71	61
22	0.020	0	0.000	0.000	0.021		0.034	0.000	0.000	70	60
23	0.007	0	0.000	0.000	0.008		0.013	0.000	0.000	71	59
24	0.000	0	0.000	0.000	0.000		0.000	0.000	0.000	69	61
25	0.002	0	0.000	0.000	0.002		0.000	0.000	0.000	70	64
26	0.001	0	0.000	0.000	0.001		0.000	0.000	0.000	71	66
27	0.001	0	0.000	0.000	0.003		0.000	0.000	0.000	72	63
28	0.004	0	0.000	0.000	0.004		0.000	0.000	0.000	70	60
29	0.004	0	0.000	0.000	0.004		0.002	0.000	0.000	70	63
30	0.005	0	0.000	0.000	0.006		0.000	0.000	0.000	71	63
SUM	1.083	-	0.099	0.052	0.966	N.A.	1.579	-0.015	0.165	-	-
AVG	0.036	9	0.003	0.002	0.032	N.A.	0.053	-0.000	0.006	71	61
NBS	Q402	N400	Q400	Q403	Q401		Q410	Q415	Q417	N406	N113

* DENOTES UNAVAILABLE DATA.
@ DENOTES NULL DATA.
N.A. DENOTES NOT APPLICABLE DATA.

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM

MONTHLY REPORT
ENVIRONMENTAL SUMMARY

SITE: ORTIZ AND REILL, LOT 8 ESCONDIDO, CALIFORN SOLAR/1087-79/04
REPORT PERIOD: APRIL,1979

DAY OF MONTH	TOTAL INSOLATION BTU/SQ.FT	DIFFUSE INSOLATION BTU/SQ.FT	AMBIENT TEMPERATURE DEG F	DAYTIME AMBIENT TEMP DEG F	RELATIVE HUMIDITY PERCENT	WIND DIRECTION DEGREES	WIND SPEED M.P.H.
1	2210	N	58	73	N	N	N
2	2369	C	59	70	O	O	O
3	2202	T	59	75	T	T	T
4	2325		64	83			
5	2249	A	64	83	A	A	A
6	1703	P	60	71	P	P	P
7	1567	P	60	*	P	P	P
8	593	L	59	64	L	L	L
9	329	I	56	*	I	I	I
10	2037	C	57	67	C	C	C
11	1221	A	57	66	A	A	A
12	2196	B	63	75	B	B	B
13	2255	L	68	85	L	L	L
14	2072	E	65	*	E	E	E
15	1872		63	74			
16	1246		61	68			
17	1550		58	65			
18	1956		56	67			
19	2467		59	71			
20	2305		63	77			
21	2091		61	*			
22	2203		60	75			
23	2257		59	75			
24	2264		61	74			
25	1939		64	82			
26	2300		66	79			
27	1706		63	74			
28	1216		60	*			
29	2050		63	76			
30	1329		63	71			
SUM	55988	N.A.	-	-	-	-	-
AVG	1866	N.A.	61	74	N.A.	N.A.	N.A.
NBS ID	0001		N113			N115	N114

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